Meeting Minutes
HIPPI-6400 Optical Working Group
Tuesday, October 8, 1996
St. Petersburg Beach, Florida

Steve Joiner of HP chaired this meeting in Stan Swirhun's absence. Vince Melendy of Methode volunteered to take the minutes. Don Tolmie did some editing and formatting on the minutes.

From 8:00 to 9:00 am, Tuesday, October 8, a kickoff meeting was held to frame the optical discussion that was to preceed that afternoon. The connector criteria developed at the Honolulu meeting on August 6 was reviewed:

Criteria	Comments
Multi-Sourcing	
Existence	Engineering Samples by 10/96 Pre-pilot quantities by 12/96
Maturity and industry acceptance	ISO?, existing or imminent standard
Attenuation	0.5 dB avg.
Return Loss	-20 dB
Mating & Demating durability	500 cycles (Negotiable)
Fiber Spacing	don't care
Field Termination	
Mechanical Engagement Force Cable retention Side Pull Temperature Humidity Thermal Cycle	 20 N 50 N 5 N -10 to +60 C ? ?
Height, Width	<12.5 mm, <25 mm
Cut-out or Faceplate opening	smaller, small enough for FCC Class A
Polarized, Keys	Yes, no (contentious)
Single mode Capable	don't care, but is a feature
Low Cost	Yes, not 'primary' Importance

Steve Joiner presented a survey regarding high speed electrical I/O specifications. This described voltage levels of the I/O's of the integrated circuits; all were dc coupled. The levels described were:

HP Glink
FC-AL 10 bit chips
LVDS
Hyper LVDS (LSI)
HP N-Plex

Steve showed how to match HP LVDS to other logic families. His data will be given to Don Tolmie for publication.

Hansel Collins of SGI established values for the SuMAC and presented them. These values are for the AC port Driver. The values not in the specification are the value for 2.5 volt PECL logic. He is trying to get as close to 2.5 volt PECL values as possible. Steve Joiner will give the value table to Don Tolmie for publication.

Minutes of Afternoon meeting at 3:00 PM:

Laser Safety Presentations:

Steve Joiner of HP described the eye safety standard and work on an amendment. The vote on amendment 76/134/CDV for IEC 825-1 passed at the committee level. It is believed this will be the amendment to go into effect on January, 1997. In theoretical work, the calculations for the maximum power limit has been done but is not correlated between vendors. Steve presented a chart of maximum power per channel for eye safety. The data and calculations are different due to interpretation of the IEC specification.

Mark Stratton of Vixel presented and stated that the eye safety issue is now measured at 100 mm in a 7 mm aperture. The goal is to have a high NA device. He presented experimental data for full mode fill of 12 fiber ribbon. The maximum power into the fiber presented was -5.2 dBm for 62.5 micron fibers and for 50 micron fiber the maximum power is -6 dBm. Both these power figures were for full mode fill techniques.

Torsten Wipiejewski of Siemens presented calculation results and the techniques used. His results in a 10 fiber ribbon was -13.4 dBm per fiber

as the maximum power worst case. He presented data for fiber elements for 1 to 12 fibers. His data shows that 10 fiber ribbon is the worst case number of fibers. For < 10 fibers and > 10 fibers the power per channel can be higher. His calculations will be placed on the HIPPI home page.

Mike Griffin of 3M presented some data on under filled launch testing. More data will be presented at the next meeting.

The power limits decrease as the wavelength of the laser decreases. It is dependent on the human eye focusing on the light transmitted.

For laser safety the choices are:

Class I which is a safe device. (strongly desired for HIPPI)

Class III B is a device used by trained personnel, and the vendor must keep track of where all these devices are sold.

Mechanical safety device with double redundancy.

OFC – this is an electrical interlock.

Safety Interlocks – this is mechanical interlock.

Action item of all vendors agreeing on power number is not completed and must still be worked. All the vendors are now working with the same document.

Ferrule Presentations:

Alan Plotts of AMP did not give a presentation on their MT ferrule since it is the same ferrule as USConnect, but AMP will give a connector presentation at the December meeting. Don Tolmie collected copies of the presentations and will send copies to whoever needs them – contact Don at det@lanl.gov. The presentation material will also be in the X3T11 mailing.

Mike Griffin - 3M

The ferrule is a Zirconia Ceramic and is called the Argus. The material has the same temperature coefficient as the fiber. Other materials are under investigation. This ferrule uses a ball and socket alignment scheme. There are two designs: 12 and 18 fibers. The fibers are on 250 micron pitch. It uses 3M's in line cable process. Engineering prototypes will be available in December. The connector loss is < 0.5 dB. They are working with 2 vendors to become alternate suppliers. The connector is a physical contact connector.

William DiBella - Methode, and Roger Weiss - PRP Systems

Roger discussed the technical aspects of the MP connector. The ferrule has been around a long time. The ferrule is constructed of V-grooves. The ferrule is two piece and is aligned by the fibers themselves. There are two alignment pins which are round and smooth. The pins are pressed into the alignment sleeve assembly. The MP product is currently installed in multiple data sites and is available now. The ferrule design has been around for 10 years. Attenuation is less than 0.5 dB after 500 cycles. Return loss is better than -20 dB. The ferrule is designed for 12 fibers with other fiber counts under development. Standard fiber stripping tools are available to strip 12 fibers. You can use a 12 ribbon or 12 loose tube fibers. Cables being made today are fixed and variable lengths. The difference between MT and MP is the alignment system.

Don Knasel - USConnec

The ferrule discussed was the MTP from USConec. This is a 12 fiber ferrule and can be between 2 to 12 fibers. It has two alignment holes. Eight connectors that use this ferrule were listed. This product was developed by NTT. The MT ferrule was introduced in 1987. MT ferrule has alignment datum being the center of the fiber. Tolerance required on precision features is less than 2.5 mm technology. Fiber hole design eliminates performance degradation caused by

Fiber geometry tolerance
Contamination during assembly
Static force deformation

This product was optimized for ribbon termination. Don presented loss data on the 12 fiber SM and MM MTP. The MT ferrule is standardized in IEC 1754-7. A license is available as of 10/1/96. Their are no patents on the MT ferrule but their are patents on the MTP connector. The ferrule is a one piece design. There was discussion on the cost of this ferrule. The NTT network is the largest user of the MT ferrule. Engineering samples and production quantities are available now. Attenuation is 0.25 dB average non contacting and 0.10 dB average with direct contact. Durability is stated at 1,000 cycles. Environmental and mechanical performance is per Conec MTP-012 Qualification test report. Relative pricing was presented. The mechanical align pins are beveled.

Ed Cady - Berg

Presented the ferrule technology of the MiniMAC connector. This uses a silicon ferrule. This creates silicon chips to fabricate the ferrules. The process will do SM and MM. Up to 50 fibers are under development, 36 fiber ferrules are available today. The ferrule halves are held together by epoxy and a plastic clips. One other source for this ferrule is being negotiated with now. The license would be for the whole connector. The key features are the alignment features which are patented. These ferrules go in to the MACII, MiniMAC, and others. The pin is a 30 mill diameter. The connector is polarized.

Steve Joiner presented the summarized the selection criteria, and the chart was filled in as follows, i.e., all of the ferrules met the selection criteria, but there were questions on the maturity of the 3M Argus.

Ferrule Type	Argus	MP	MT	Berg
Existence	X	X	X	X
Maturity		X	X	X
Performance Goals	X	X	X	X
Multiple Sources	X	X	X	X

Cost issues were discussed and the HIPPI folks said that cost was a minor issue. Availability is a major issue. It is very important to have a connector product now. The multiple source issue was discussed. The optic transceiver manufacturers support was discussed and added to the above matrix. It was added to see which ferrule the transceiver could support; no conclusions were reached.

It was moved to call for a vote at 5:58 PM and seconded. The voting rules were explained to be the same as in X3T11, except that there is no membership requirement. The vote was one vote per company, a wholy owned subsiderary of a company that was also present could not vote, (e.g., Cray and SGI shared their vote), and a simple majority ruled.

Roger Ronald of Raytheon E-Systems moved, and Greg Chesson of SGI seconded, to accept the MT ferrule for HIPPI-6400-PH. A roll-call vote, based on the meeting meeting attendance sheet, was tallied as:

3M	No
Alcoa Fujikura Ltd.	Yes
AMCC	Absent
AMP	Yes
Berg Electronics	No
Corning Inc.	Yes
Digital Equipment Corp	Abstain
Essential Communications	Absent
Hewlett-Packard	Yes
Honeywell	No
IBM	Abstain
Los Alamos National Lab	Yes
Lucent Technologies	Absent
Methode	No
Motorola	Yes
NCSA	Abstain
NTT International Corp.	Yes
Optivision	Yes
PRP Systems Inc.	No
Pulse/Technitrol	Absent
Raytheon E-Systems	Yes
Siecor	Yes
Siemens	Yes
Silicon Graphics	Yes
Sun	Abstain
Triquint	Absent
Unisys	Abstain
U.S. Connect	Yes
Vixel Corp	Yes
W.L. Gore	Yes

Motion passed: 15 Yes, 5 No, 5 Abstain, 5 Absent

A motion to make an interface standard that would allow the mating of other connect to the MT was ruled out of order.

Now that a ferrule is chosen, presentations on connectors that use the MT ferrule will be made at the December meeting, and a connection selection voted on.

It was suggested to address all questions regarding the transceivers be sent to the HIPPI reflector at hippi@network.com.

It was noted that Matt Stratton would probably be chairing future meetings as Stan Swirhun is cutting back.

The meeting ajourned at 6:25 PM.

Attendance (Optical portion of HIPPI meeting)

Sidney Berglund	3M
Michael Griffin	3M
Tad Stostak	3M
Earl Hayes	Alcoa Fujikura Ltd.
Ron Kleckauski	Alcoa Fujikura Ltd.
Machie Shiflett	Alcoa Fujikura Ltd.
Tom Palkert	AMCC
Terry Bittner	AMP
Kirk Bovill	AMP

Charles Brill	AMP
Dan Brown	AMP
Jim Kevern	AMP
Alan Plotts	AMP
Ed Cady	Berg Electronics
John Ellis	Berg Electronics
Carol McGill	Corning, Inc
Steve Swanson	Corning Inc.
Jeff Young	Cray Research
Bob Willard	Digital Equipment Corp
Bob Pearson	Essential Communications
Francois Gaullier	Hewlett-Packard
Steve Joiner	Hewlett-Packard
Christie Rice	Honeywell
Henry Brandt	IBM
James Hoffman	Los Alamos National Lab
Don Tolmie	Los Alamos National Lab
Louise Bryant	Lucent Technologies
Norm Lampert	Lucent Technologies
Yvonne Reeves	Lucent Technologies
William DiBella	Methode
Vince Melendy	Methode
Glenn Raskin	Motorola
Dan Schwartz	Motorola
Von Welch	NCSA
Yasuo Sasaki	NTT International Corp.
Joe Parker	Optivision
Roger Weiss	PRP Systems Inc.
Michael Leib	Pulse/Technitrol
Robert Clarkson	Raytheon E-Systems
Craig Davidson	Raytheon E-Systems
Roger Ronald	Raytheon E-Systems
Todd Hudson	Siecor
Schelto van Doorn	Siemens
James Luther	Siemens
Torsten Wipiejewski	Siemens
Greg Chesson	Silicon Graphics
Hansel Collins	Silicon Graphics
Don Sanders	Silicon Graphics
Aij Ghjasi	Sun
David Perkins	Triquint
Edward Chang	Unisys
Bill Blubaugh	U.S. Connect
Don Knasel	U.S. Connect
Tosluski Satake	U.S. Connect
Mark Stratton	Vixel Corp
Mark Donhowe	W.L. Gore
Emile Sayegh	W.L. Gore
Craig Theorin	W.L. Gore